2013 Building Energy Efficiency 45-Day Language Hearing

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Today's Agenda: RESIDENTIAL

Time	Topic	Presenter
09:00 AM	Introductions/ General Information about 2013 Title 24 Rulemaking Calendar	Mazi Shirakh
09:15 AM	Revisions to Sections 10-101 – 10-114 – Energy Building Regulations, All Occupancies	Gary Flamm / Mazi Shirakh
9:45 AM	Revisions to Sections 100.0 – General Provisions, Definitions, All Occupancies	Gary Flamm
10:00 AM	Revisions to Sections 110.0 to 110.5 – Mandatory Requirements for Manufactured Equipment – All Occupancies	Martha Brook / Mazi Shirakh
10:15 AM	Revisions to Sections 110.6 to 110.8 – Envelope Mandatory Requirements	Mazi Shirakh
10:20 AM	Revisions to Sections 110.10 – Mandatory Requirements for Solar Ready Buildings – All Occupancies	Patrick Saxton
10:35 AM	Revisions to Sections 150.0 – Residential Mandatory Requirements for Newly Constructed Buildings	Mazi Shirakh / Gary Flamm
11:05 PM	Revisions to Section 150.1 – Performance and Prescriptive Requirements for Residential Newly Constructed Buildings	Mazi Shirakh
12:00 PM	Lunch	
1:00 PM	Revisions to Section 150.2 – Residential Additions and Alterations	Mazi Shirakh
1:30 PM	Title 24, Part 11 – Residential Voluntary "Reach" Standards	Martha Brook
2:00 PM	Revisions to Reference Joint Appendices and Residential Appendices	Mazi Shirakh
3:00 PM	Revisions to Residential ACM Approval Manual	Martha Brook
4:00 PM	Public Comments	
5:00 PM	Adjourn	

2013 Title 24 Rulemaking Calendar

45 Day Language Hearings	March 12-13, 2012
Release 15 Day Language	April 11, 2012
ACM Workshop	May 3, 2012
2013 Standards Adoption Hearing	May 9, 2012

Part 1, §10-102

Definitions

- Edited definitions for clarity
- Added new Definitions:
  - ACM Reference Manual; Alternative Component Package; Compliance Option; Data Registry, (residential and nonresidential); Documentation Author; Exceptional Method; Proposed Design Building; Standard Design Building;

§10-103
Permit, Certificate, Information, and Enforcement Requirements

1. Delete obsolete language
2. Reorganize and revise to improve clarity
3. Introduce option for enforcement agencies to create simplified compliance documents – this was requested by CALBO, and will apply to alterations and additions less than 300 sqft. that do not have a HERS verification requirement.
4. Introduce option for simple alterations to residential buildings to submit Certificate of Compliance to enforcement agency in conjunction with submittal of the Installation Certificate prior to final inspection – this is offered as a convenience for situations such as HVAC replacements. Applies only to projects that require HERS verification for which the enforcement agency does not require building design plans to be submitted to a plan check process.

§10-103
Permit, Certificate, Information, and Enforcement Requirements

5. Update to Reference Joint Appendix JA7 – JA7 is a new appendix created to provide specifications for registration of electronic compliance documents.
6. Expand documentation author signature requirement to all documents – Certificate of Installation , Certificate of Acceptance, and Certificate of Verification in order to accommodate the administrative assistance that responsible signers of the compliance documents require for registration procedures.

§10-103
Permit, Certificate, Information, and Enforcement Requirements

7. Require registration of all nonresidential compliance documents by January 1, 2015 – the 1-year delay is to allow time to prepare the infrastructure needed for the nonresidential registration procedures. Allows for the creation of non-residential data registries if approved by the Commission, and retains the existing residential HERS provider Data registries that may also register nonresidential documents.
8. Introduce a document repository feature – when documents are registered in a HERS data registry or a nonresidential data registry, a copy of each document will be archived in an electronic document repository in the custody of the Energy Commission and utilized for enforcement, for public information requests and for energy research.

Part 1, §10-106

Locally Adopted Energy Standards

- Edited for clarity

Part 1, §10-107

Interpretations

- Added: The Executive Director may authorize procedures, protocols, and information that the Executive Director determines to be technically equivalent to that specified in the Part 6, Alternative Calculation Method Approval Manuals, or the Reference Appendices

Part 1, §10-109

Compliance Software, Alternative Component Packages, Exceptional Methods, and Data Registries

- Reorganized and edited for clarity
  - General Requirements; Application; Compliance Software, Alternative Component Packages, Exceptional Methods, Data Registries and Repositories

- Inserted new subsection to address data registries

Part 1, §10-110

Procedures for Consideration of Applications Under Sections 10-104, 10-106, 10-108, and 10-109

- Clarified: The Executive Director may charge a fee to recover the costs of processing and reviewing applications **with the exception of Section 10-106 applications**

Part 1, §10-111

Certification and Labeling of Fenestration Product U-Factors, Solar Heat Gain Coefficients, and Air Leakage

- Labeling
  - Clarified the differences between manufactured and site-built fenestration. Manufactured fenestration requires air leakage testing and site-built fenestration does not.
  - Clarified that manufactured fenestration requires a label for each product where as site-built does not. It requires at least one label for multiple fenestration products.
  - NFRC references updated and language clarifications

Part 1, §10-111

Certification and Labeling of Fenestration Product U-Factors, Solar Heat Gain Coefficients, and Air Leakage

- Certification Requirements
  - Added VT language because now it is included in Part 6
  - Added text to emphasizing the Component Modeling Approach software tool – CMAST, to allow manufactures and specifiers to use this program to acquire an NFRC certified label; however, currently It's required for the 2008 Energy Standards

Part 1, §10-114

Determination of Outdoor Lighting Zones, and Administrative Rules for Use

- Removed requirements for amending local outdoor ordinances to be consistent with changes made to Section 140.7 (Outdoor lighting power requirements)

§10-
COMMENTS

PART 6 - §100.0 (100)

Scope

- Created new subsection for covered processes
- Added Exception 2 to Section 100.0(f)
  - Mixed Occupancy, to address lighting when at least 90 percent of the combined conditioned plus unconditioned floor area of the building, the entire building lighting may comply with the provisions of Title 24, Part 6 applicable to that occupancy.

§100.1 (101)

Definitions

- Edited for clarity
- Added information for new documents incorporated by reference.
- Updated versions numbers of documents incorporated by reference
- Added new definitions to support changes made to other Sections of Part 6
- Deleted definitions no longer used

§100.1 (101)

Definitions

- Created additional groupings:
  - Fenestration
  - Lighting (terms)
  - Lighting Controls
  - Nonresidential Building Occupancy Types
  - Nonresidential Function Area Types
  - Outdoor Lighting (terms & function area types)
  - Sign lighting (terms)
  - Residential Space Types

§100.1 (101)

Definitions

- Added new definitions
- Replaced Definitions & cited other code:
  - LED definitions deleted and cite definitions in ANSI/IES RP-16-10

§100
COMMENTS

§110.0 (110)

MANDATORY REQUIREMENTS FOR SYSTEMS AND EQUIPMENT—GENERAL

Revised for clarity

§110.1 (111)

MANDATORY REQUIREMENTS FOR APPLIANCES

(a) Revised for clarity

(b) New section to clarify allowable sources for appliance efficiency data for use for verification of conformance with Part 6.

(c) New section to clarify when conformance with Part 6-specific appliance efficiency requirements may be demonstrated using minimum efficiency, or by criteria approved by the Energy Commission.

§110.2 (112)

MANDATORY REQUIREMENTS FOR SPACE CONDITIONING EQUIPMENT

(a) Efficiency.

- Air Conditioners and Heat Pumps: Efficiency tables updated to include new federal appliance efficiency standards - Table 110.2-A, B

§110.2 (112)

MANDATORY REQUIREMENTS FOR SPACE CONDITIONING EQUIPMENT

(c) Upgradable Setback Thermostats

- All unitary heating and/or cooling systems including heat pumps that are not controlled by a central energy management control system (EMCS) shall have an Upgradeable Setback Thermostat
- Stakeholders have raised a number of patent related issues; CEC and IOU staff are investigating these issues and will prepare a response soon.

§110.2 (112)

MANDATORY REQUIREMENTS FOR SPACE CONDITIONING EQUIPMENT

(f) Low Leakage Air-Handling Units – Requires manufacturer to certify to the energy Commission conformance with the qualification requirements in Reference Joint Appendix JA9 in order to qualify for the low leakage air-handling unit performance compliance credit.

§110.10 NEW

MANDATORY REQUIREMENTS FOR SOLAR READY BLDGS

- Solar zone is a portion of the **roof** designated and reserved for the future installation of a solar electric or solar thermal system

- Single family residences in subdivisions with >= 10 homes AND tentative subdivision map deemed complete on or after January 1, 2014
  - Solar zone = 250 SF
  - 3 stories or more and total area <= 2000 SF, solar zone = 150 SF
  - Not required for additions/alterations unless there is an existing solar zone

§110.10 NEW

MANDATORY REQUIREMENTS FOR SOLAR READY BLDGS

- Low-rise multi-family with >= 8 dwelling units or with central water heating
  - Solar zone = 15% of roof area, excluding any skylight area

  OR
  - Alternate reserved space (on-site, non-roof) = 30% of roof area
  - Not required for additions/alterations unless there is an existing solar zone

§110.10 NEW

MANDATORY REQUIREMENTS FOR SOLAR READY BLDGS

- Hotel/Motel and high-rise multi-family
  - 10 stories or fewer, solar zone = 15% of roof area, excluding any skylight area
  - 11 stories or greater, solar zone = 1.5% of roof area multiplied by number of stories, excluding any skylight area

  OR
  - Alternate reserved space (on-site, non-roof) = 2 times the solar zone area that would otherwise be required, maximum 30%
  - Not required for additions/alterations unless there is an existing solar zone or unless roof space increased >= 20%

§110.10 NEW

MANDATORY REQUIREMENTS FOR SOLAR READY BLDGS

- Other nonresidential with 3 stories or fewer
  - Solar zone = 40% of roof area, excluding any skylight area

  OR
  - Alternate reserved space (on-site, non-roof) = 60% of roof area
  - Not required for additions/alterations unless there is an existing solar zone or unless roof space increased >= 20%
- Solar zone can be divided, each section at least 80 SF
- Minimum solar zone dimension 5 feet

§110.10 NEW

MANDATORY REQUIREMENTS FOR SOLAR READY BLDGS

- Area of a solar energy system installed at time of construction counts toward solar zone (including non-roof systems)
- Solar zone complies with access, pathway, smoke ventilation and spacing requirements in 2013 Title 24, Part 9 (California Fire Code)
- Solar zone is oriented between 110°-270° or on flat roof

§110.10 NEW

MANDATORY REQUIREMENTS FOR SOLAR READY BLDGS

- Shading
  - No obstructions in solar zone
  - When obstructions present, solar zone located at a distance at least 2X the height difference between obstruction and solar zone
  - Applies to any vent, chimney, architectural feature, roof mounted equipment or other obstruction that is on the roof or any other part of the building
  - Exception for obstructions located north of solar zone

§110.10 NEW

MANDATORY REQUIREMENTS FOR SOLAR READY BLDGS

- Structural integrity – as designed dead load and live load for the solar zone shown on the construction documents
- Interconnection pathways – construction drawings indicate a pathway for routing of conduit/plumbing from reserved space to point of interconnection with electrical service/water-heating system
- Copy of construction documents or comparable documents indicating relevant solar ready information provided to occupant

§100.10 NEW

MANDATORY REQUIREMENTS FOR SOLAR READY BLDGS

- Main Electrical Service Panel – Single Family Res Only
  - Minimum busbar rating of 200 amps
  - Space for future circuit breaker at opposite (load) end from input feeder/main circuit
  - Space marked “For Future Solar Electric”

§110
COMMENTS

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(d)

- Increased mandatory minimum requirements for insulation; raised floor from R-13 to R-19 (for 15-day Language) Ceiling/Rafter Roofs from R-19 to R30
  - **Exception:** Rafter roofs in an Addition/Alteration minimum requirement R-19

Section 150.0(h) – Space Conditioning Equipment

- Outdoor Condensing Units - Clearance: requirements for 5 ft clearance from dryer vent outlets (new)
- Central Forced Air Heating Furnaces – Maximum Temperature Rise: requirement to configure installed systems to operate within the manufacturer's specified maximum temperature rise.

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(g) – Vapor Retarders

- In Climate Zones 14 and 16, a Class II vapor retarder shall be installed on the conditioned space side of all insulation in all exterior walls, vented attics, and unvented attics with air-impermeable insulation
- In Climate Zones 1-16 with unvented crawl spaces the earth floor of the crawl space shall be covered with a Class I or Class II vapor retarder.

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(f) – Hotel and Motel Guest rooms

- Added captive card key controls, occupancy controls, or automatic controls to control lighting and space conditioning equipment in hotel and motel guestrooms.
- One half of the 120 volt receptacle in each guestroom shall be controlled. Additional information included in 130.5(d)
- Mechanical requirements are also included in 120.2(c)

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(j) – Water Systems Piping and Insulation

- All nonrecirculating hot water piping of nominal diameter ¾ inch (19 mm) or larger must be insulated
- The maximum length of 1inch (25 mm) piping in a non-recirculating domestic hot water distribution system shall be limited to a total length of 15 feet (4.5 m) – Exception for pipes dedicated for tubs
- 150.0(m)11 duct leakage is now a mandatory measure.

§150.0(k) (150(k))

Residential Lighting

- Edited for Clarity
- Replaced luminaire efficacy (lumens per watt) table with default list of high VS low efficacy
- Lighting in Bathrooms: Minimum of one high efficacy luminaire each bathroom, all other high efficacy or vacancy sensor
- Lighting in Garages, Laundry, Utility rooms shall be high efficacy

§150.0(k) (150(k))

Residential Lighting

- For low-rise residential buildings with ≥4 dwelling units, outdoor site lighting shall comply with nonresidential outdoor lighting Standards
- Low-rise multi-family residential building
  - ≤ 20 % common areas shall be high efficacy luminaires or controlled by an occupant sensor
  - > 20 % common areas shall meet nonresidential lighting requirements
- Lighting installed in MF corridors and stairwells occupant sensors reduce lighting power ≥50 %

Appendix JA8

Qualification Requirements for Residential Luminaires Using LED Light Source

- Edited for Clarity
- ReferencesIES LM-79
- Only for residential applications
- Must be Certified To Energy Commission
- Minimum efficacy in Table JA-8-A
- Minimum CCT indoor VS outdoor
- Minimum CRI 90
- No incandescent sockets of any type
- Minimum testing lab requirements
- Labeling requirements

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(m)1 CMC compliance

- Updated duct construction standards: ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition

- New requirement for ducts claiming exemption from mandatory insulation requirements when located in directly conditioned space to be confirmed by HERS verification that leakage to outside is equal to or less than 25 cfm.

Section 150.0(m)11 Duct System Leakage

- HERS verification of duct leakage is now a mandatory requirement applicable to all climate zones.

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(m)12 Air Filtration

- Labeling of air filter grills - specifies requirements for labeling of filter grills for design airflow rate and design pressure drop to assist homeowner in selection of correct replacement air filter products.
- Air filter efficiency – specified minimum MERV 6 efficiency consistent with ASHRAE 62.2 requirements.
- Pressure drop – Requires the air distribution system to be designed to accommodate the maximum clean filter pressure drop for the air filter specified for the system as rated using AHRI Standard 680, for the applicable system design airflow. This is a default requirement for pressure drop. More stringent requirements (smaller values for allowed pressure drop) may be specified by system designers, or by the 150.0(m)13 sizing Tables.
- Labeling of air filter products – requires air filter products to be labeled by the manufacturer to disclose the AHRI Standard 680 performance ratings. This will enable the home owner to select an air filter that will work properly in their system.

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(m)13 - Duct System Sizing and Air Filter Grille Sizing

- New mandatory requirement to either:
  - HERS verify the air distribution system complies with a fan efficacy requirement of 0.58 Watt/cfm at a cooling coil airflow rate of 350 cfm/ton determined using the RA3.3 protocol, or
  - Otherwise size the system's return ducts and filter grills in accordance with prescriptive tables 150.0-C or D,

This requirement does not apply to all HVAC alterations.

Sections 150.0(m)14 and 15 – Bypass Duct and Zonal Control

- New mandatory requirement that zonally controlled central forced air systems must:
  - HERS verify in every zonal control mode the air distribution system complies with a fan efficacy requirement of 0.58 Watt/cfm at a cooling coil airflow rate of 350 cfm/ton using the RA3.3 protocol.
  - Bypass ducts are not allowed to be used.

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(n) - Water Heating System

- A 120V electrical receptacle within 3 feet from the water heater. This electrical receptacle shall be accessible to the water heater with no obstructions

- A Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(0) - Ventilation for indoor air quality

- Adopt ASHRAE 62.2-2010 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings," Addenda b, c, e, g, h, i and l to ANSI/ASHRAE 62.2-2010 published in the 2011 supplement
- Require that installation and performance of mechanical ventilation systems for whole-building ventilation be verified by a HERS rater. Procedures for HERS verification of ventilation systems are new protocols in Reference Residential Appendix RA3.7.
- Add requirement that continuous operation of central forced air system fans used in central fan integrated (CFI) ventilation systems is not a permissible method of providing the whole-building ventilation required in Section 4 of ASHRAE Standard 62.2.

§150.0 (150)

MANDATORY FEATURES FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.0(q) – Fenestration Products Mandatory Requirements

- Fenestration products including skylight products must have a maximum U-factor of 0.58
- An EXCEPTION Up to 10 square feet of fenestration area or 0.5% of the Conditioned Floor Area whichever is greater is exempt from the U-factor requirement.

§150.0
COMMENTS

§150.1 (151)

RESIDENTIAL GENERAL PERFORMANCE AND PRESCRIPTIVE REQUIREMENTS FOR NEWLY CONSTRUCTED BUILDINGS

- **Section 150.1(b)** – Performance Standards – Clarifying language for how to determine the budget for standard design, proposed design, and the calculation of the energy budget. Most of the language included in this section will move to the RACM Manual.
- **Section 150.1(c) –** Insulation
  - Roof Deck - Above roof deck insulation of R-4 or below roof deck Insulation of R-13 required in climate zones 9-15
  - Walls – R21+4 in CZ 1, 11-16; R15+4 in CZ 2-10
- **Section 150.1(c)1 –** Quality Insulation Installation – QII is required in CZ 1-5 and 11-16. Verifying the quality of insulation installation shall be met following the procedure specified in Reference Residential Appendices, RA3.5

§150.1 (151)

RESIDENTIAL GENERAL PERFORMANCE AND PRESCRIPTIVE REQUIREMENTS FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.1(c)3 – Fenestration

- Fenestration U-factor of 0.32 in all CZ, and SHGC of 0.25 in CZ 2, 4, and 6-16
- Skylights shall have a maximum U-factor of 0.55 and SHGC of 0.30 in all climate zones
- For Fenestration containing **dynamic** glazing, the lowest-rated labeled U-factor and SGHC shall be used to demonstrate energy compliance and shall not be weighted averaged with non dynamic glazing.
- For dwelling units containing unrated site-built fenestration only can use Nonresidential Reference Appendix NA6 to calculate
U-factor and SHGC

§150.1 (151)

RESIDENTIAL GENERAL PERFORMANCE AND PRESCRIPTIVE REQUIREMENTS FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.1(c)7 - Space heating and cooling

- Clarified refrigerant charge requirements apply to ducted “air-cooled” air conditioners and ducted split system “air-source” heat pumps.
- Eliminate the Saturation Temperature Measurement Sensor (STMS).
- Add requirements for increased efficiency and weigh-in refrigerant charge installation certificate documentation for air conditioner and heat pump equipment that cannot meet either the standard charge verification procedure in RA3.2 or an alternative special case procedure from RA1. The higher minimum efficiency is not required if the system is a ductless system.

  This was added in order to provide for regulation of systems such as mini-splits and multi-splits that cannot meet HERS verification requirements for refrigerant charge.

  Packaged systems are exempt from the weigh-in requirement if refrigerant charge is certified by manufacturer.

§150.1 (151)

RESIDENTIAL GENERAL PERFORMANCE AND PRESCRIPTIVE REQUIREMENTS FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.1(c)8 – Domestic water Heating System

- For systems serving multiple dwelling units, a central water-heating system shall be installed with a solar water-heating system that provides a minimum solar savings fraction of 0.20 in climate zones 1 through 9 and a minimum solar savings fraction of 0.35 in climate zones 10 through 16.
- For systems serving individual dwelling units, an electric-resistance water heater may be installed as the main water heating source only if natural gas is unavailable, the water heater is located within the building envelope, and a solar water-heating system that provides a minimum solar savings fraction of 0.50 is installed.

§150.1 (151)

RESIDENTIAL GENERAL PERFORMANCE AND PRESCRIPTIVE REQUIREMENTS FOR NEWLY CONSTRUCTED BUILDINGS

Section 150.1(c)9 Space Conditioning Ducts

- Ducts must have R-8 in CZ 1-5, and 9-16; R-6 in CZ 6-8 – No more R-4.2
- Duct sealing moved to Mandatory measures 150.0(m)11.

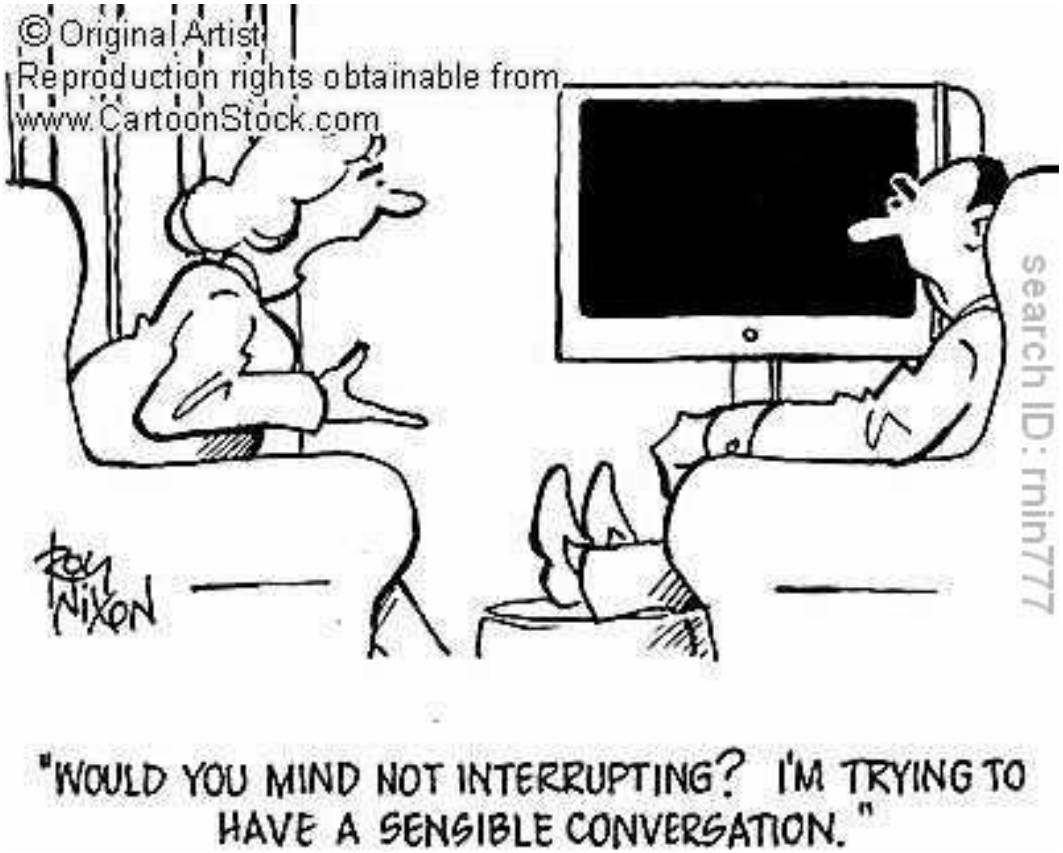
150.1(c)10 Central Fan Integrated Ventilation Systems – Clarified that the prescriptive requirement for verification of fan Watt draw shall be verified by a HERS rater.

Section 150.1(c)11A – Roofing Products - Low-rise steep-sloped, all roofing products must have reflectance of 0.20 and emittance of 0.75 in CZ 10-15 or SRI 16

Section 150.1(c)11B – Roofing Products - Low-rise low-sloped, in CZ 13 and 15 shall have reflectance of 0.65 and emittance of 0.75 or SRI 78

Section 150.1(c)12 – Ventilation Cooling – Whole house fans required in CZ 4, and 8-14

§150.1
COMMENTS



§150.2 (152)

ADDITIONS AND ALTERATIONS

- **Section 150.2 – Additions** – General clarification to describe the requirements in additions less than 1,000 square feet and installation of glazing less than 50 square feet. This requirements were in the 2008 Standards but have been clarified here for the 2013 Standards
- **EXCEPTION 1 to 150.2(a):** Clarifies that for additions less than 1000 square feet, mechanical ventilation for whole-building ventilation airflow is not required; however, all other applicable requirements of ASHRAE 62.2 still apply to additions less than 1000 square feet.
- **EXCEPTION 2 to Section 150.2(a):** Where the space in the attic or rafter area is not large enough to accommodate the required R-value, the entire space shall be filled with insulation provided such installation does not violate Section 1203.s of Title 23, Part 2.

§150.2 (152)

ADDITIONS AND ALTERATIONS

- **EXCEPTION to Section 150.2(a)1 – Prescriptive Approach.** Clarified and simplified the total fenestration and west facing fenestration requirements for additions that are 700 square feet or less and 400 square feet or less. Eliminates the credit for existing glass removed in exchange for larger glass allowances.
- **Sections 150.2(a)2B – Performance Approach.** Simplified the rules determining the standard design and proposed design for Existing Plus Alterations Plus Additions.
- **Sections 150.2(a)2C -** Additions larger than 1,000 square feet shall meet the ASHRAE Standard 62.2 Section 4 requirement to provide whole-building ventilation airflow

§150.2 (152)

ADDITIONS AND ALTERATIONS

- **EXCEPTION to Section 150.2(b)1B - Glazing Properties.** Replacement fenestration up to a total area of no more than 75 square feet with a U-factor no greater than 0.40 and in climate zones 2, 4, and 6-16, a SHGC value no greater than 0.35.
- **Sections 150.2(b)1C**
  - clarified qualifications for “new or replacement space conditioning systems”
- **Sections 150.2(b)1D and E**
  - Clarified qualifications for “entirely new or replacement duct system”
  - eliminated the 60% leakage reduction method of compliance.

§150.2 (152)
ADDITIONS AND ALTERATIONS

- **Section 150.2(b)1F – Altered Space Conditioning System – Mechanical Cooling**
  - Revised the criteria that triggers refrigerant charge verification requirement: now applicable when there is an alteration of refrigerant-containing components.
  - Refrigerant charge verification was clarified to be in CZ's 2, 8, 9, 10, 11, 12, 13, 14, and 15 for ducted split system central “air-cooled” air conditioners and ducted split system “air-source” heat pumps.
  - Add requirements for increased efficiency and submittal of weigh-in refrigerant charge installation certificate documentation for air conditioner and heat pump equipment that cannot meet either the standard charge verification procedure in RA3.2 or an alternative special case procedure from RA1. The higher minimum efficiency is not required if the system is a ductless system.

    This was added in order to provide for regulation of systems such as mini-splits and multi-splits that cannot meet HERS verification requirements for refrigerant charge.

    Packaged systems are exempt from the weigh-in requirement if refrigerant charge is certified by manufacturer.

§150.2 (152)
ADDITIONS AND ALTERATIONS

Section 150.2(b)G – Water Heating Systems

- Clarified the water heater replacement requirements for natural gas, propane, and electric water heaters not exceeding 50 gallons.

§150.2 (152)

ADDITIONS AND ALTERATIONS

Section 150.2(b)1H – Roofs

- The reflectance and emittance requirements have been changed to be consistent with the requirements in Section 150.1(c)
- The increased free ventilation area 1/150 sf has been removed.
- The ¾ inch air-space changed to no less than 1.0 inch between the top of the roof deck to the bottom of the batten to allow free air movement
- Specifies that the reflectance requirement for low-slope roof in alteration is 0.63
- Provides continuous insulation as a prescriptive alternative to low-slope cool roof requirements for the reflectance range of 0.25 to 0.62

Aged Solar Reflectance	Insulation R-value	Aged Solar Reflectance	Insulation R-value
0.62-0.60	2	0.44-0.40	12
0.59-0.55	4	0.39-0.35	16
0.54-0.50	6	0.34-0.30	20
0.49-0.45	8	0.29-0.25	24

§150.2 (152)
ADDITIONS AND ALTERATIONS

Section 150.2(2) – Performance Approach for Alterations

- Allow two paths for determining the standard design for ceiling, roof, walls, floors, air distribution systems, and water heating systems:
  - A path without third party verification which generally sets the standard design on the mandatory requirements or proposed design – meaning smaller compliance credits
  - A path with third party verifications which generally sets the standard design on the existing conditions – meaning larger compliance credits
  - For fenestration, the standard design without third party verification is The U-factor of 0.40 and SHGC value of 0.35. With third party verification, the standard design is based on existing conditions if the proposed U-factor is ≤ 0.40 and SHGC value is ≤ 0.35.

§150.2
COMMENTS

Title 24, Part 11

Residential Voluntary "Reach" Standards

- Tier 1: Energy Budget <= 85% of Part 6 Energy Budget and calculated total building electricity consumption <= 10,000 kWh
  - ☼ Additional energy efficiency or on-site PV to reduce electricity
- Tier 2: Energy Budget <= 70% of Part 6 Energy Budget and calculated total building electricity consumption <= 8,500 kWh
  - ☼ Additional energy efficiency or on-site PV to reduce electricity

New for 15 Day Language

- Tier 3: Zero Net Energy - ZNE Homes shall comply with all Tier 2 requirements and have a Home Energy Rating System (HERS) Design Rating of zero or less
- Energy Budget & HERS Design Rating calculated by Energy Commission certified Compliance Software

Title 24, Part 11

Residential Voluntary "Reach" Standards

- Prerequisites are required measures if applicable to building project
  - Home Energy Rating System "Design Rating" computed by Compliance Software and included on Certificate of Compliance
  - Quality Insulation Inspection (QII)
  - Maximum volume of water in distribution pipe between water heater and any fixture fitting
    - Systems without recirculation <= 32 ounces
    - Systems with recirculation <= 16 ounces
    - Exception for braches serving bathtubs without showers

Title 24, Part 11
Residential Voluntary "Reach" Standards

- Prerequisites, cont.
  - Indoor Lighting
    - All permanently installed lighting is high efficacy
    - Controls as required by Part 6
    - Permanent lighting must be installed in kitchens, bathrooms, utility rooms, and garages at a minimum
    - Every room has either permanent lighting or at least one switched receptacle
  - Outdoor lighting
    - All permanently installed lighting mounted to building is high
    - Controls as required by Part 6

Title 24, Part 11
Residential Voluntary "Reach" Standards

- Additions and Alterations
  - Tier 1: Energy Budget <= 95% of Part 6 Energy Budget for each mechanical system altered (heating, space cooling, water heating system)
  - Tier 2: Energy Budget <= 90% of Part 6 Energy Budget for each mechanical system altered
  - Envelope changes without any changes to mechanical systems do not require any measures above Part 6
  - Energy Budget calculated by Energy Commission certified Compliance Software

Title 24, Part 11

Residential Voluntary "Reach" Standards

- Additions and Alterations, cont.
  - Prerequisites are required measures if applicable to building project
    - QII
    - High Efficacy Indoor Lighting
    - High Efficacy Outdoor Lighting

Green Building Standards – Energy Efficiency
COMMENTS